Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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	)	File No. SAT-STA-2009____-_____
	)	Call Sign S2658
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	)	File No. SES-STA-2009____-_____
	)	Call Sign E020306
In the Matter of:	)	
	)	File No. SES-STA-2009____-_____
ECHOSTAR SATELLITE OPERATING L.L.C.	)	Call Sign E980005
	)	
Application for Emergency Special	)	File No. SES-STA-2009____-_____
Temporary Authority to De-Orbit the	)	Call Sign E070014
EchoStar 5 Satellite from 147.925° W.L.	)	
	)	File No. SES-STA-2009____-_____
	)	Call Sign E980081
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	)	File No. SES-STA-2009____-_____
	)	Call Sign E980082
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APPLICATION FOR EMERGENCY SPECIAL TEMPORARY AUTHORITY

Pursuant to Section 25.120 of the Commission's rules, 47 C.F.R. §25.120, EchoStar Satellite Operating L.L.C. ("DISH") requests emergency special temporary authority ("STA") for a period of 30 days to (1) de-orbit its EchoStar 5 satellite from its current location at 147.925° W.L., and (2) perform telemetry, tracking and command ("TT&C") functions with EchoStar 5 during the de-orbiting operations. Because managing EchoStar 5's rapidly depleting propellant levels is essential to obtaining as high a disposal orbit as possible, DISH requests authority to begin de-orbiting on August 3, 2009, to allow de-orbit procedures to begin that evening.

The root cause of the problem that requires de-orbiting is unique to the EchoStar 5 satellite: use of the satellite's momentum wheels was lost irretrievably in 2003. That in turn had a chain reaction effect. The satellite's engines had to be fired repeatedly to keep the satellite

properly oriented. Not only did this require greater propellant expenditure, but it caused the bookkeeping method for gauging propellant consumption to underestimate the propellant used and overestimate the propellant left even taking into account the additional propellant usage caused by the momentum wheels impairment.[1]

DISH discovered this modeling discrepancy just days ago when yet another propellant consumption safety precaution – a test of the thermal capacity of the remaining propellant – was executed. Specifically, this additional thermal gauging technique highlighted the disparity with the other methods. This led to a more detailed analysis by DISH, its sister company EchoStar Corporation and Telesat Canada, which flies the satellite under EchoStar and DISH's direction. The collective results of that review completed this week make this request necessary. Prior to this most recent test, DISH projected that there was approximately 70 kg of propellant remaining on EchoStar 5, which would have provided sufficient reserves to allow operations for at least another year at its existing orbital location.[2] As previously reported to the Commission, DISH

[1] In addition to the bookkeeping method, DISH also generally applies the Pressure Volume Temperature ("PVT") modeling technique as a separate monitor on satellite propellant consumption. However, errors in its application contributed to the overestimation of available propellant.

[2] DISH recently completed the relocation of the EchoStar 5 satellite from the 129° W.L. to its present location. *See* EchoStar Satellite Operating L.L.C., File No. SAT-A/O-20081003-00215 (granted Feb. 3, 2009); *see also* Letter to Robert Nelson, Chief, Satellite Division, FCC, from Petra A. Vorwig, Counsel for EchoStar Satellite Operating L.L.C., dated June 18, 2009 (notifying the Bureau that EchoStar 5 began operations at 148° W.L. on June 16). Based on available calculations at the time of the application and the move, DISH had no reason to believe that the satellite's end of life was imminent, or that propellant reserves were too low. If DISH were aware of the depleted propellant state, DISH would not have sought permission to move the satellite from 129° W.L., and would have retired the satellite from that orbital location. Out of an abundance of caution, and as part of a broader review of fuel consumptions safeguards, DISH will seek to ensure its internal policies and procedures, as well as those of its contractors, include appropriate checks, including prophylactic measures, prior to the redeployment of satellites to new orbital locations. More generally, while preliminary results suggest that calculation errors were primarily the result of the loss of EchoStar 5's momentum wheels, DISH has begun a

had budgeted approximately 7 kg of propellant for end-of-life maneuvers.[3] DISH now believes that there is approximately 20 kg of total propellant on EchoStar 5, including both fuel and oxidizer. There is, however, no reliable means to pinpoint the exact proportion of each propellant. DISH has, therefore, concluded out of an abundance of caution that the satellite, currently located at 147.925° W.L.,[4] has reached the end of its useful life. DISH estimates that there should be sufficient propellant remaining on the satellite to achieve a safe disposal orbit if the process begins as soon as practicable.

DISH's goal is to reach a final disposal orbit of at least 300 km above its operational geostationary orbit, and will dispense all available propellants in its efforts to achieve that orbit. This proposed disposal orbit altitude exceeds the minimum required by Section 25.283 of the Commission's rules, which is calculated below. 47 C.F.R. §25.283. The input data required for the calculation is as follows:

> Total Solar Pressure Area "A" = 70.4 m^2 (includes area of solar array, satellite body and deployed antennas)
> "M" = Mass at time of deorbit = 1500.6 kg
> "C_R" = Solar Pressure Radiation Coefficient = 1.37

Using the formula given in Section 25.283 of the Commission's rules, 47 C.F.R. §25.283, the Minimum Disposal Orbit Perigee Altitude is calculated as follows:

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comprehensive review of the effectiveness and comprehensiveness of its propellant preservation measurements across all of its satellite fleet and will work with its partners to add prophylactic measures to the procedures and safeguards if and where appropriate.

[3] *See* EchoStar Satellite Operating L.L.C., File No. SAT-A/O-20081003-00215, Technical Annex, at 8-9 (filed Oct. 3, 2008).

[4] *See* Stamp Grant, File No. SAT-A/O-20081003-00215 (granted Feb. 3, 2009) (granting authority to operate EchoStar 5 at 148° W.L. *See also* Stamp Grant, File No. SAT-MOD-20090430-00048 (granted July 8, 2009) (authorizing DISH to operate EchoStar 5 at 147.925° W.L.).

= 36,021 km + 1000 x C_R x A/m
= 36,021 km + 1000 x 1.37 x 70.4/1500.6
= 36,085 km
= 299 km above GSO (35,786 km)

Thus, the designated disposal orbit of 300 km above geostationary orbit exceeds the required minimum by a margin of 1 km.

Upon discovery of the need for an emergency de-orbit, DISH has taken steps to ensure that our residential subscriber base is not adversely affected by the loss of service from 148° W.L.[5] DISH has begun the process of migrating programming and content from EchoStar 5 to other satellites in our fleet, including, but not limited to, the Ciel 2 satellite, which has spot beam capabilities. Currently, the EchoStar 5 satellite is used primarily for the delivery of local services to the three markets in the western United States, and commercial services for businesses. The process of shifting programming to other satellites in DISH's fleet may require repointing or replacing consumer satellite dishes for affected subscribers. DISH will provide any necessary new equipment to these subscribers free of charge. The potential disruption to consumers will be significantly reduced because the process of moving these local markets to a different orbital location was underway prior to the discovery of the need to de-orbit. DISH

[5] DISH is also exploring potential replacement satellites for 148° W.L., which has proven to be an important part of DISH's ability to provide complementary and niche services to consumers over time, including local services, international programming, and business programming. DISH and its partners plan to launch two new satellites this year, which provides two potential satellites available for future redeployment to 148° W.L. DISH will provide the Commission with greater detail on a long-term replacement plan at a later date.

calculates that over 96 percent of affected subscribers in those three markets will be able to receive their local broadcast stations from the new satellite locations.[6]

Grant of this application will not cause harmful interference to other satellites. During the relocation, regular DBS transmissions on the EchoStar 5 satellite will remain switched off, and only TT&C operations will be performed with the satellite. During relocation, DISH will operate EchoStar 5 in accordance with the following conditions:

- DISH will coordinate its TT&C operations with all potentially affected operating satellite networks.
- No harmful interference will be caused to any lawfully operating satellite network or radiocommunication system, and DISH operations will cease immediately upon notification of harmful interference. Further, DISH shall notify the Commission immediately of such an event.
- DISH will use good faith efforts to reach a disposal orbit of at least 300 km above its operational geostationary orbit.
- DISH will ensure that all energy sources on the EchoStar 5 satellite are depleted upon completion of de-orbit maneuvers. The batteries will be left in a permanent state of discharge, chemical propulsion systems will be depleted and the electrical propulsion system will be disabled.
- DISH will notify the Commission within five business days of completing de-obit maneuvers reporting and detailing the final disposal orbit.

[6] Virtually all subscribers that live outside the applicable spot beam reside in a single county in Wyoming that is non-contiguous to the rest of the local market. DISH will continue to explore potential long-term solutions to provide coverage to all subscribers.

Grant of this application is in the public interest because it will ensure the safe de-orbit of the EchoStar 5 satellite with minimal disruption to DISH subscribers. DISH respectfully requests that the Commission grant the requested emergency special temporary authority to de-orbit EchoStar 5 from the nominal 148° W.L. orbital location.

Respectfully submitted,

/s/ *Linda Kinney*

Pantelis Michalopoulos
Petra A. Vorwig
Steptoe & Johnson LLP
1330 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 429-3000

Linda Kinney
Vice President, Law and Regulation
Brad Gillen
Director and Senior Counsel
DISH Network LLC
1233 20th Street, N.W.
Suite 302
Washington, DC 20036-2396
(202) 293-0981

Counsel for EchoStar Satellite Operating L.L.C.

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